Chapter 296-849 WAC

BENZENE

NEW SECTION

WAC 296-849-100 Scope. This chapter applies to **all** occupational exposure to benzene.

Definition:

Exposure is the contact an employee has with benzene, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry such as inhalation, ingestion, skin contact, or skin absorption.

Exemptions: This chapter does not apply to any of the following:

- Liquids, vapors, mixtures in containers or pipelines, and gas in natural gas processing plants when benzene content is 0.1% or less.
- Gasoline and other fuels containing benzene once they leave the final bulk wholesale facility and are being:
  - Transported;
  - Sold;
  - Distributed;
  - Stored;
  - Dispensed either:
    - Outdoors;

    OR
    - Indoors four hours or less a day.
  - Used as a fuel.
- Laboratories subject to the requirements in hazardous chemicals in laboratories, WAC 296-62-400, the General occupational health standards, chapter 296-62 WAC.
- Oil and gas drilling, production, and servicing operations.
- Solid materials that contain only trace amounts of benzene.
- Coke ovens.

All requirements in this chapter will not apply to every workplace. Follow these steps to find out which requirements apply to you.

Step 1: If any of your work tasks are listed in Table 1, follow Table 1.

- Go to Step 2a if you have additional work tasks or other exposures that are not covered in Table 1.

Table 1
Requirements that Apply to Specific Tasks

If employees do any of the following:	Then the only requirements in this chapter that apply to those tasks are:

Load and unload benzene at bulk storage facilities that use vapor control systems for all loading and unloading operations.	✎ The labeling requirement found in Use preventive practices, WAC 296-849-11010.
Perform tasks around sealed transport pipelines carrying gasoline, crude oil, or other liquids containing more than 0.1% benzene.	✎ This requirement found in Train employees, WAC 296-849-11050: – Make sure training and information includes specific information on benzene for each hazard communication training topic. For the list of hazard communication training tropics, go to the Safety and health core rules, chapter 296-800 WAC, and find Inform and train your employees about hazardous chemicals in your workplace, WAC 296-800-17030.
Work with, or around, sealed containers of liquids containing more than 0.1% benzene.	✎ Emergency requirements found in Make medical evaluations available, WAC 296-849-12030. ✎ Requirements found in Maintain employee medical records, WAC 296-849-12080. ✎ Respirator requirements found in Provide and use respirators, WAC 296-849-13045.

Step 2a: Follow requirements in the basic rules sections, WAC 296-849-11010 through WAC 296-849-11090, for tasks **not** listed in Table 1.

✎ This includes completing an exposure evaluation, as specified in Conduct employee exposure evaluations, WAC 296-849-11060, to:

– Measure employee fifteen-minute and eight-hour exposure concentrations of airborne benzene;

AND

– Determine if employee exposure concentrations are above, at, or below these values:

✂ Eight-hour time-weighted average **(TWA_8)** . . . . . .1 parts per million (ppm).

✂ Fifteen-minute short-term exposure limit **(STEL)** 5

ppm.

✂ Eight-hour action level **(AL)** . . . . . .0.5 ppm.

Step 2b: Use employee exposure concentrations and follow Table 2 to find out which sections apply.

Table 2
Section Application

If employee exposure concentrations are:	**Then continue to follow requirements in the basic rules, WAC 296-849-11010 through WAC 296-849-11090, and:**
✎ **Above** the TWA_8 or STEL	✎ Additional requirements found in: – Exposure and medical monitoring, WAC 296-849-12005 through WAC 296-849-12080; **AND** – Rules for exposure control areas, WAC 296-849-13005 through WAC 296-849-13045.
✎ **At or below** the TWA_8 or STEL; **AND** ✎ **At or above** AL	✎ Additional requirements found in exposure and medical monitoring, WAC 296-849-12005 through WAC 296-849-12080.
✎ **Below** the AL, and STEL	✎ No additional requirements apply if exposures remain below the AL and STEL.

NEW SECTION

WAC 296-849-110 Basic rules.

Summary:

Your responsibility:

To measure and minimize employee exposure to benzene.

IMPORTANT:

To determine which requirements to follow for your work tasks, go to Table 1 in the scope of this chapter, WAC 296-849-100.

Contents:

NEW SECTION

WAC 296-849-11010 Use preventive practices.

You must:

✎ Make sure containers of benzene in the workplace are labeled, tagged, or marked with this warning:

DANGER
CONTAINS BENZENE
CANCER HAZARD

Note: Containers should be kept tightly covered when not in use. This helps prevent unnecessary exposure and accidental spills.

References: Additional requirements are found in other chapters as follows:

✎ For spills, leaks, or other releases of benzene, go to Emergency response, chapter 296-824 WAC.

✎ For labeling go to:

– The Safety and health core rules, chapter 296-800 WAC, and find Label containers holding hazardous chemicals, WAC 296-800-17025;

AND

– Material safety data sheet and label preparation, chapter 296-839 WAC.

NEW SECTION

WAC 296-849-11020 Establish exposure control areas.

You must:

✎ Establish temporary or permanent exposure control areas

where airborne concentrations of benzene are above, or can be reasonably expected to be above, the permissible exposure limits (PELs) for benzene by doing all the following:

– Distinguish the boundaries of exposure control areas from the rest of the workplace in any way that minimizes employee access.

– Post signs at access points to exposure control areas that include this warning:

DANGER
Benzene
Cancer Hazard
Flammable - No Smoking
Authorized Personnel Only
Respirator Required

– Allow only authorized personnel to enter exposure control areas.

Note: ✎ You may use permanent or temporary enclosures, caution tape, ropes, painted lines on surfaces, or other materials to visibly distinguish these areas or separate them from the rest of the workplace.
✎ When distinguishing exposure control areas you should consider factors such as:
– The level and duration of airborne exposure.
– Whether the area is permanent or temporary.
– The number of employees in adjacent areas.

Reference: If exposure control areas are established, go to Provide and use respirators, WAC 296-849-13045.

NEW SECTION

WAC 296-849-11030 Conduct employee exposure evaluations.

IMPORTANT:

✎ When you conduct an exposure evaluation in a workplace where an employee uses a respirator, the protection provided by the respirator is not considered.

✎ Following this section will meet the requirements to identify and evaluate respiratory hazards found in another chapter, Respiratory hazards, chapter 296-841 WAC.

You must:

✎ Conduct an employee exposure evaluation to determine airborne concentrations of benzene by completing Steps 1 through 7 of the exposure evaluation process, each time any of the following apply:

– No evaluation has been conducted.

✂ You have up to thirty days to complete an evaluation once benzene is introduce into your workplace.

– Changes have occurred in any of the following areas that may result in new or increased exposures:

✂ Production.

✂ Processes.

✂ Exposure controls such as ventilation systems or work practices.

✂ Personnel.

– You have any reason to suspect new or increased exposure may occur.

– Spills, leaks, or other releases have been cleaned up.

Note: As part of your exposure evaluation after cleanup, you will make sure exposure concentrations have returned to prerelease concentrations.

Exposure evaluation process.

IMPORTANT:

If you are evaluating employee exposures during cleaning and repair of barges and tankers that contained benzene:

✎ Collect samples that effectively measure benzene concentrations that employees may be exposed to;

AND

✎ Skip to Step 7.

Step 1: Identify all employees who have exposure to benzene in your workplace.

Step 2: Identify operations where fifteen-minute exposures could exceed benzene's short-term exposure limit (STEL) of 5 parts per million (ppm).

✎ Include operations where it is reasonable to expect high, fifteen-minute exposures, such as operations where:

– Tanks are opened, filled, unloaded, or gauged.

– Containers or process equipment are opened.

– Benzene is used as a solvent for cleaning.

Note: You may use sampling devices such as colorimetric indicator tubes or real-time monitors to screen for activities where employee exposure concentrations could be high.

Step 3: Select employees from those working in the operations you identified in Step 2 who will have their fifteen-minute exposures measured.

Step 4: Select employees from those identified in Step 1 who will have their eight-hour exposures measured.

✎ Make sure the exposures of the employees selected represent:

– Eight-hour exposures for **all** employees identified at Step 1;

AND

– Each job classification, work area, and shift for employees identified in Step 1.

Note: ✎ You need to keep a written description of your sample collection strategy in the records required by Establish employee exposure records, WAC 296-849-11090.

✎ The purpose of a sample collection strategy is to make sure the variety of exposures occurring in your workplace is represented by your exposure evaluation.

✎ Following Steps 3 through 6 of this evaluation process will help you create your sample collection strategy.

Step 5: Select and use sample collection and analysis methods that are accurate to ±25%, with a confidence level of

95%.

Note: Here are examples of methods that meet this accuracy requirement:
- OSHA Method 12 for air samples.
- NIOSH Method 1500.

Links: To access the OSHA method, go to http://www.osha.gov/dts/sltc/methods/toc.html.
To access the NIOSH method, go to http://www.cdc.gov/niosh/homepage.html and link to the *NIOSH Manual of Analytical Methods*.

Step 6: Measure employee exposure concentrations by collecting air samples representative of employees identified at Step 1.

When collecting samples make sure:

– You collect samples from each selected employee's breathing zone.

Collecting area samples is permitted after emergency releases.

– You collect fifteen-minute samples from employees selected at Step 3.

– You collect at least one sample representing the eight-hour exposure for each employee selected at Step 4.

Note:
- You may use any sampling method that meets the accuracy requirement in Step 4. Examples of these methods include:
  – Real-time monitors that provide immediate exposure concentration measurements.
  – Equipment that collects samples that are sent to a laboratory for analysis.
- The following are examples of methods for collecting samples representative of eight-hour exposures:
  – Collect one or more continuous samples, for example, a single eight-hour sample or four four-hour samples.
  – Take a minimum of five brief samples (also called grab samples) during the work shift at randomly determined times.
- If you collect samples during work shifts longer than eight hours, collect samples from the eight-hour portion of the shift expected to have the highest exposure concentration.

Step 7: Have the samples you collected analyzed to obtain employee exposure concentrations for eight-hour and fifteen-minute exposures.

Go to the scope of this chapter, WAC 296-849-100, and compare employee exposure concentrations to the **values** found in Step 2a and follow Step 2b to determine if additional chapter sections apply.

Note:
- You may contact your local WISHA consultant for help:
  – Interpreting data or other information.
  – Calculating eight-hour or fifteen-minute employee exposure concentrations.
- To contact a WISHA consultant, go to another chapter, the Safety and health core rules, chapter 296-800 WAC, and find Service locations for L&I within the resources section.

NEW SECTION

WAC 296-849-11040 Provide and use personal protective equipment (PPE).

You must:

Make sure employees wear appropriate PPE as protection from skin or eye contact with liquid benzene.

Note: Harmful amounts of benzene can enter the body through skin and eye contact.

Reference: To see additional personal protective equipment requirements, go to the Safety and health core rules, chapter 296-800 WAC.

NEW SECTION

WAC 296-849-11050 Train employees.

You must:

✎ Provide training and information to employees:

– At the time of initial assignment to a work area where benzene is present;

AND

– At least every twelve months for employees exposed to airborne concentrations at or above the action level (AL) of 0.5 parts per million (ppm).

✎ Make sure training and information includes:

– Specific information on benzene for each hazard communication training topic. For the list of hazard communication training tropics, go to the Safety and health core rules, chapter 296-800 WAC, and find Inform and train your employees about hazardous chemicals in your workplace, WAC 296-800-17030;

AND

– An explanation of the contents of each of the following and guidance about where to find a copy:

✂ This chapter.

✂ The following found in another chapter, the General occupational health standards, chapter 296-62 WAC:

② The substance safety data sheet--benzene, found in WAC 296-62-07525, Appendix A.

② The substance technical guidelines--benzene, found in WAC 296-62-07527, Appendix B.

② The medical surveillance guidelines for benzene, found in WAC 296-62-07529, Appendix C;

AND

– A description of the medical evaluation requirements of this chapter found in:

✂ Make medical evaluations available, WAC 296-849-12030;

AND

✂ Remove employees from benzene exposure, WAC 296-849-12050.

Reference: To see additional training and information requirements:

✎ Go to the Safety and health core rules, chapter 296-800 WAC;

AND

✎ Find employer chemical hazard communication, WAC 296-800-170.

NEW SECTION

WAC 296-849-11065 Follow rules for observing exposure measurement.

You must:

(1) Provide affected employees and their designated representatives an opportunity to observe the measurement or monitoring activity during Step 6 of the exposure evaluation process found in exposure evaluations, WAC 296-849-11030.

(2) Make sure observers who need to enter areas with benzene exposure to observe exposure measurement or monitoring:

✎ Are provided with and use the same protective clothing, respirators, and other personal protective equipment (PPE) that employees working in the area are required to use;

AND

✎ Follow safety and health requirements that apply.

NEW SECTION

WAC 296-849-11070 Notify employees.

You must:

✎ Provide written notification about employee exposure concentrations to the employees represented by your exposure evaluation within five business days after employee exposure concentrations become known to you.

– In addition, when employee exposure concentrations are above a permissible exposure limit (PEL), provide written notification within fifteen business days after these exposure concentrations become known to you, of the following:

✂ Corrective actions being taken and a schedule for completion;

AND

✂ Any reason why exposures cannot be lowered to below the PELs for benzene.

Note: ✎ You can notify employees individually or post the notifications in areas readily accessible to affected employees.
✎ When notifying employees about corrective actions, your notification may refer them to a separate document that is available and provides the required information.

NEW SECTION

WAC 296-849-11090 Establish employee exposure records.

You must:

✎ Establish complete and accurate employee exposure records that include at least the following:

– The name, Social Security number, or other unique identifier, and job classification of:

✂ The employee sampled;

AND

✂ All other employees represented by the sampled employee.

– The type of respirator worn, if any.

– A description of the sample collection and analysis methods used.

– A description of the sample collection strategy used to determine representative employee exposures.

– The dates, number, durations, and results of each sample taken.

Note: It is useful to record any personal protective equipment worn by the employee, in addition to the type of respirator worn.

Reference: To see additional requirements for employee exposure records including access, maintenance, and transfer requirements, go to Employee medical and exposure records, chapter 296-802 WAC.

NEW SECTION

WAC 296-849-120 Exposure and medical monitoring.

Summary:

Your responsibility:

To detect any significant changes in employee health and exposure concentrations.

IMPORTANT:

These sections apply when employee exposure concentrations are either:

✎ At or above the action level (AL) of 0.5 parts per million (ppm) for benzene;

OR

✎ Above either of the permissible exposure limits for benzene.

Contents

Conduct periodic employee exposure evaluations

WAC 296-849-12010.
Make medical evaluations available
WAC 296-849-12030.
Remove employees from benzene exposures
WAC 296-849-12050.
Maintain employee medical records
WAC 296-849-12080.

NEW SECTION

WAC 296-849-12010 Conduct periodic employee exposure evaluations.

You must:

✎ Monitor employee exposure concentrations as specified in Table 3, by repeating Steps 6 and 7 of the exposure evaluation process found in Conduct employee exposure evaluations, WAC 296-849-11030.

Note: If you document that one work shift consistently has higher exposure concentrations than another for a particular operation, then you can limit sample collection to the work shift with higher exposures.

Periodic Exposure Evaluation Frequencies
Table 3

If	**Then**
Eight-hour employee exposure concentrations from evaluations are at or above the AL of 0.5 ppm, but below the eight-hour time-weighted average (TWA_8) of 1 ppm	Conduct evaluations at least every twelve months for the employees represented by the concentrations
Eight-hour employee exposure concentrations are above the TWA_8	Conduct evaluations at least every six months for the employees represented by the concentrations
You have been conducting evaluations at least every six months; **AND** Two consecutive exposure evaluations, taken at least seven days apart, show eight-hour employee exposure concentrations have dropped below the TWA_8, but remain at or above the AL	You may **decrease** your evaluation frequency to every twelve months for employees represented by the concentrations

Fifteen-minute employee exposure concentrations are above the short-term exposure limit **(STEL)** of 5 ppm	Evaluate as often as necessary to monitor exposure concentrations
Two consecutive evaluations, taken at least seven days apart, show eight-hour employee exposure concentrations have dropped below the AL	You may **stop** periodic exposure evaluations for employees represented by the concentrations

NEW SECTION

WAC 296-849-12030 Make medical evaluations available.

IMPORTANT:

Medical evaluations conducted under this section will satisfy the medical evaluation requirement found in Respirators, chapter 296-842 WAC.

You must:

(1) Provide the relevant medical follow-up specified in Tables 4 and 5 to any employee exposed to benzene during an emergency.

(2) Make medical evaluations available to current employees who meet the following criteria, by completing Steps 1 through 6 of the medical evaluation process:

- Potential or actual exposure to benzene at or above the action level (AL) for at least thirty days in any twelve-month period.
- Potential or actual exposure to benzene at or above either permissible exposure limit (PEL) for at least ten days in a twelve-month period.
- Past exposure to concentrations above 10 ppm benzene for at least thirty days in a twelve-month period before November 11, 1988.
- Current or past work as a tire building machine operator using solvents containing more than 0.1% benzene during tire building operations.

Helpful tool:

Declination form for nonemergency related medical evaluations.

You may use this optional form to document employee decisions to decline participation in part or all of your medical evaluation process.

You must:

(3) Make medical evaluations available at no cost to

employees.

✎ Pay all costs, including travel costs and wages associated with any time spent outside of the employee's normal work hours;

AND

✎ Make medical evaluations available at reasonable times and places.

Medical evaluation process:

Step 1: Identify employees who qualify for medical evaluations.

Step 2: Make medical evaluations available for employees identified in Step 1 at these times:

✎ Initially, before the employee starts a job or task assignment where benzene exposure will occur.

✎ Every twelve months from the initial medical evaluation.

✎ Whenever the employee develops signs or symptoms commonly associated with toxic benzene exposure.

✎ After benzene exposure from an emergency.

Step 3: Select a licensed health care professional (LHCP) who will conduct or supervise medical evaluations and make sure:

✎ Individuals who conduct pulmonary function tests have completed a training course in spirometry sponsored by an appropriate governmental, academic, or professional institution, if they are not licensed physicians;

AND

✎ Your LHCP uses an accredited laboratory, such as one accredited by a nationally or state-recognized organization, to conduct laboratory tests.

Step 4: Make sure the examining LHCP receives all of the following before performing the medical evaluation:

✎ A copy of:

– This chapter.

– The following found in the General occupational health standards, chapter 296-62 WAC:

✂ The substance safety data sheet--benzene found in WAC 296-62-07525, Appendix A.

✂ The substance technical guidelines--benzene found in WAC 296-62-07527, Appendix B.

✂ The medical surveillance guidelines for benzene found in WAC 296-62-07529, Appendix C.

✎ A description of the duties of each employee being evaluated and how the duties relate to benzene exposure.

✎ Actual or representative exposure concentrations for each employee being evaluated.

✎ A description of the personal protective equipment (PPE) each employee being evaluated uses or will use.

✎ Information from employment-related physical examinations for each employee being evaluated when this information is not

available to the examining LHCP.

✎ Instructions that the written opinions LHCPs provide you for each employee, be **limited to** the following information:

– Specific records, findings, or diagnosis relevant to the employee's ability to work around benzene.

– The occupationally relevant results from examinations and tests.

– A statement about whether or not medical conditions were found that would increase the employee's risk for impairment from exposure to benzene.

– Any recommended limitations for benzene exposure.

– Whether or not the employee can use respirators and any recommended limitations for respirator or other PPE use.

– A statement that the employee has been informed of medical results and medical conditions caused by benzene exposure requiring further explanation or treatment.

Step 5: Provide the medical evaluation to the employee. Make sure it includes the content listed in Table 4, Content of medical evaluations, and Table 5, Medical follow-up requirements.

Step 6: Obtain the examining LHCP's written opinion for each employee's medical evaluation completed and give a copy to the employee within fifteen days of the evaluation date.

Note: If the written opinion is not limited to the information specified at Step 4, send it back and obtain a revised version without the additional information.

IMPORTANT:

These tables apply when conducting medical evaluations, including medical follow-up for employees exposed to benzene during emergencies.

Table 4
Content of Medical Evaluations

When conducting	Include
An initial evaluation	✎ A detailed history including: – Past work exposure to benzene or other hematological toxins; – Exposure to marrow toxins outside of current employment; – Exposure to ionizing radiation; – Family history of blood dyscrasias including hematological neoplasms; – History of blood dyscrasias including genetic hemoglobin abnormalities, bleeding abnormalities, and abnormal function of formed blood elements; – History of renal or liver dysfunction;

	– History of medications routinely taken. ✎ A complete physical examination – Include a pulmonary function test and specific evaluation of the cardiopulmonary system **if** the employee is required to use a respirator for at least thirty days a year. ✎ A complete blood count including a: – Leukocyte count with differential; – Quantitative thrombocyte count; – Hematocrit; – Hemoglobin; – Erythrocyte count and indices (MCV, MCH, MCHC). ✎ Additional tests the examining LHCP determines are necessary based on alterations in the components of the blood or other signs that may be related to benzene exposure. ✎ **Medical follow-up as required in Table 5.**
Annual evaluations	✎ An updated medical history covering: – Any new exposure to potential marrow toxins; – Changes in medication use; – Any physical signs associated with blood disorders. ✎ A complete blood count including a: – Leukocyte count with differential; – Quantitative thrombocyte count; – Hematocrit; – Hemoglobin; – Erythrocyte count and indices (MCV, MCH, MCHC).

	✎ Additional tests that the examining LHCP determines necessary, based on alterations in the components of the blood or other signs that may be related to benzene exposure. ✎ A pulmonary function test and specific evaluation of the cardiopulmonary system every three years if the employee is required to use a respirator for at least thirty days a year. ✎ **Medical follow-up as required in Table 5.**
Evaluations triggered by employee signs and symptoms commonly associated with the toxic effects of benzene exposure	✎ An additional medical examination that addresses elements the examining LHCP considers appropriate.
Evaluations triggered by employee exposure during an emergency	✎ A urinary phenol test performed on the exposed employee's urine sample within seventy-two hours of sample collection. – The urine sample must be collected at the end of the work shift associated with the emergency; – The urine specific gravity must be corrected to 1.024. ✎ **Medical follow-up as required in Table 5.** **Reference:** Employees who are not covered by medical evaluation requirements in this chapter may be covered by medical evaluation requirements in other chapters such as Emergency response, chapter 296-824 WAC.

Table 5
Medical Follow-up Requirements

If	Then
✎ The **complete blood count test** result is normal.	✎ No further evaluation is required.
– The **complete blood count test** shows any of the following abnormal conditions:	✎ Repeat the complete blood count within two weeks:

– A leukocyte count less than 4,000 per mm^3 or an abnormal differential count; **OR** – A thrombocyte (platelet) count that is either: ✂ More than 20% below the employee's most recent values; **OR** ✂ Outside the normal limit (95% C.I.) according to the laboratory; **OR** – The hematocrit or hemoglobin level is either of the following, and can not be explained by other medical reasons: ✂ Below the normal limit (outside the 95% C.I.), as determined by the laboratory for the particular geographical area; **OR** ✂ Persistently decreasing compared to the employee's preexposure levels.	– If the abnormal condition persists, refer the employee to a hematologist or an internist for follow-up medical examination and evaluation, unless the LHCP has good reason to believe it is unnecessary; – The hematologist or internist will determine what follow-up tests are necessary; **AND** ✎ Follow the requirements found in Medical removal.
Results from the **urinary phenol test** conducted during an emergency evaluation show phenol levels less than 75 mg/L.	✎ No further evaluation is required.
Results from the **urinary phenol test** conducted during an emergency evaluation show phenol levels equal or more than 75 mg/L.	✎ Provide a complete blood count monthly for three months. Include a:

	– Leukocyte count with differential; – Thrombocyte count; – Erythrocyte count; **AND** ✎ If any of the abnormal conditions previously listed in this table for complete blood count results are found: – Provide the employee with periodic examinations, if directed by the LHCP; – **Refer the employee** to a hematologist or an internist for follow-up medical examination and evaluation unless the LHCP has good reason to believe a referral is unnecessary; – Follow the requirements found in Medical removal; **AND** – The hematologist or internist will determine what follow-up tests are necessary.

NEW SECTION

WAC 296-849-12050 Remove employees from benzene exposures.

IMPORTANT:

This section applies when an employee is referred to a hematologist or an internist for follow-up medical examination and evaluation required in Table 5, medical follow-up requirements found in medical evaluations, WAC 296-849-12030.

You must:

(1) Remove the employee from areas where benzene exposure is above the action level (AL) by doing either of the following:

✎ Transfer the employee to a job currently available that:

– The employee qualifies for, or could be trained for in a short period of time;

AND

– Will keep the employee's exposure to benzene as low as possible and never above the AL;

OR

✎ Remove the employee from the workplace until either:

– A job becomes available that:

✂ The employee qualifies for, or could be trained for in a short period of time;

AND

✂ Will keep the employee's exposure to benzene as low as possible and never above the AL;

OR

– The employee is returned to work or permanently removed from benzene exposure as determined by completing the Medical evaluation process for removed employees.

(2) Maintain the employee's current pay rate, seniority, and other benefits.

Note: If you must provide medical removal benefits and the employee will receive compensation for lost pay from other sources, you may reduce your medical removal benefit obligation to offset the amount provided by these sources. Examples of other sources are:

✎ Public or employer-funded compensation programs;

✎ Employment by another employer, made possible by the employee's removal.

You must:

(3) Complete Steps 1 through 4 of the medical evaluation process for removed employees, **within six months** of the date the licensed health care professional (LHCP) refers an employee to a hematologist or internist for follow-up.

✎ Make sure all examinations and evaluations are provided at no cost to the employee.

– Make examinations and evaluations available at reasonable times and places;

AND

– Pay for travel costs and wages, including any time spent outside of the employee's normal work hours.

Medical evaluation process for removed employees:

Step 1: Make sure the following is provided to the hematologist or internist:

✎ The information you provided to the LHCP in Step 4 of medical evaluations, WAC 296-849-12030;

✎ The employee's medical record as described in medical records.

Note: The examining LHCP may provide this information for you.

Step 2: Provide the employee an examination and evaluation by a hematologist or internist.

✎ When the examination and evaluation is completed, you and the employee must be informed, in writing, of the referring LHCP's decision to continue **or** end the employee's removal from benzene exposure.

✎ Include the following in the LHCP's decision if removal of the employee continues:

– The expected time period for removal to continue;

AND

– Requirements for future medical examinations to review the decision.

✎ If the LHCP recommends the employee **end removal** and return to the usual job with benzene exposure, **skip Steps 3 and 4.**

Step 3: Provide further medical examination and evaluation to the employee when the LHCP's decision from Step 2 informs you that medical removal must continue.

Note: ✎ During this step the LHCP, in consultation with the hematologist or internist, decides whether the employee:
– May return to their usual job;
OR
– Should be permanently removed from exposures that exceed the AL.
✎ If the LHCP recommends the employee return to their usual job, skip Step 4.

Step 4: When the LHCP recommends permanent removal for the employee, make sure all the following conditions are met:

✎ The employee has an opportunity to transfer to another job that is currently available (or will become available);

✎ The job is one the employee qualifies for, or could be trained for in a short period of time;

✎ There is no reduction in the employee's current pay rate, seniority, and other benefits;

✎ The employee's benzene exposures will be as low as possible, but never more than the AL.

NEW SECTION

WAC 296-849-12080 Maintain employee medical records.

IMPORTANT:

This section applies when a medical evaluation is performed, or any time a medical record is created for an employee exposed to benzene.

You must:

✎ Maintain complete and accurate medical records for each employee receiving a medical evaluation and make sure the records include **all** the following:

– The employee's name and Social Security number, or other unique identifier;

– A copy of the licensed health care professional's (LHCP's) written opinions including written decisions and recommendations for the employee removed from exposure;

– A copy of the information required in Step 4 of the medical evaluation process, found in WAC 296-849-12030, **except** for the copy of this chapter and the appendices listed.

Note: Your medical provider may keep these records for you. Other medical records such as an employee's medical history, need to be kept as a confidential record by the medical provider and accessed only with the employee's consent.

Reference: For additional employee medical record requirements, including access, maintenance, and transfer requirements go to

NEW SECTION

WAC 296-849-130 Rules for exposure control areas.

Summary:

Your responsibility:

To protect employees from exposure to benzene by using feasible exposure controls and appropriate respirators.

IMPORTANT:

These sections apply when existing or potential employee exposure concentrations exceed either of the following permissible exposure limits (PELs):

✎ The eight-hour time-weighted average (TWA_8) of 1 part per million (ppm);

OR

✎ The fifteen-minute short-term exposure limit (STEL) of 5 ppm.

Contents:

Establish an exposure control plan
WAC 296-849-13005.
Control employee exposures
WAC 296-849-13020.
Provide and use respirators
WAC 296-849-13045.

NEW SECTION

WAC 296-849-13005 Establish an exposure control plan.

Exemption: This section does not apply to the cleaning and repair of barges and tankers that contained benzene.

You must:

(1) Establish and implement a written exposure control plan for work areas where existing or potential exposures exceed either of the permissible exposure limit (PEL) for benzene.

✎ Make sure the plan includes a schedule for developing and implementing feasible exposure controls to reduce benzene exposure to, or below, the PELs.

Reference: To see examples of exposure controls, go to Respiratory hazards, chapter 296-841 WAC, and find Table 1 in Control employee exposure, WAC 296-841-20010.

Note: Respirators and other personal protective equipment (PPE) help protect employees from exposures, but are **not** substitutes for feasible exposure controls.

You must:

✎ Review and update your exposure control plan as needed,

based on the most recent exposure evaluation results.

(2) Provide a copy of your exposure control plan to affected employees and their designated representatives when they ask to review or copy it.

NEW SECTION

WAC 296-849-13020 Control employee exposures.

IMPORTANT:

Respirators and other personal protective equipment (PPE) do **not** substitute for feasible exposure controls.

You must:

✎ Use feasible exposure controls to reduce exposures, as specified in Table 6.

Reference: To see examples of exposure controls, go to Respiratory hazards, chapter 296-841 WAC, found in Table 1 in Control employee exposures, WAC 296-841-20010.

Table 6
Exposure Control Requirements

If:	**Then you must use feasible controls to:**
You have operations where employees clean and repair barges or tankers which have contained benzene	Keep all employee exposure concentrations below 10 parts per million (ppm).
You can document that benzene is used for less than thirty days a year in the workplace	Reduce eight-hour employee exposure concentrations to a time-weighted average of 10 ppm or less. **Note:** If employee exposure concentrations are between 1 and 10 ppm you are permitted to use respirators or a combination of respirators and feasible controls to protect employees.
Employees are exposed to benzene above a PEL for at least thirty days a year	Reduce eight-hour employee exposure concentrations to the TWA_8 of 1 ppm or less; **AND** Reduce fifteen-minute employee exposure concentrations to the STEL of 5 ppm or less.

NEW SECTION

WAC 296-849-13045 Provide and use respirators.

IMPORTANT:

These requirements are in addition to the requirements found in:

- Respiratory hazards, chapter 296-841 WAC;
- Respirators, chapter 296-842 WAC.

You must:

(1) Provide respirators and require that employees use them when exposure is above either permissible exposure limit (PEL) for benzene, including any of the following:

- Employees are in an exposure control area;
- Feasible exposure controls are being put in place;
- Exposure controls are not feasible;
- Feasible exposure controls do not reduce exposures to, or below, a PEL;
- Emergencies.

(2) Meet these requirements to protect employees from benzene exposure above a PEL:

- Limit selection of escape respirators to either:

– A full-facepiece organic vapor gas mask;

OR

– A full-facepiece self-contained breathing apparatus (SCBA);

OR

– A hood-style SCBA that operates in positive-pressure mode.

- Make sure respirator cartridges or canisters are replaced at the beginning of each work shift, or sooner if their service life has expired.
- Make sure canisters on gas masks and powered air-purifying respirators (PAPRs) have a minimum service life of four hours when tested under these conditions:

– A benzene concentration of 150 ppm;

– A temperature of 25☜C;

– A relative humidity of 85%;

– A flow rate of one of the following:

- 64 liters per minute (lpm) for nonpowered air-purifying respirators;
- 115 lpm for **tight-**fitting PAPRs;
- 170 lpm for **loose-**fitting PAPRs.

- Provide an employee a respirator with low breathing

resistance, such as a PAPR or an air-line respirator when the:

– Licensed health care professional's (LHCP's) written opinion recommends this type of respirator;

AND

– Employee cannot use a negative-pressure respirator.

NEW SECTION

WAC 296-849-190 Definitions.

Action level an airborne concentration of benzene of 0.5 parts per million (ppm) calculated as an eight-hour time-weighted average.

Authorized personnel individuals specifically permitted by the employer to enter the exposure control area to perform necessary duties, or to observe employee exposure evaluations as a designated representative.

Benzene liquid benzene, benzene vapor, and benzene in liquid mixtures and the vapors released by these liquids.

The Chemical Abstract Service (CAS) Registry Number for benzene is 71-43-2. CAS numbers are internationally recognized and used on material safety data sheets (MSDSs) and other documents to identify substances. For more information see http://www.cas.org/about.

Breathing zone the space around and in front of an employee's nose and mouth, forming a hemisphere with a 6- to 9-inch radius.

Bulk wholesale storage facility any bulk terminal or bulk plant where fuel is stored before its delivery to wholesale customers.

Container any container, except for pipes or piping systems, that contains benzene. It can be any of the following:

- Barrel;
- Bottle;
- Can;
- Cylinder;
- Drum;
- Reaction vessel;
- Storage tank.

Day any part of a calendar day.

Designated representative any individual or organization to which an employee gives written authorization;

OR

A recognized or certified collective bargaining agent without regard to written employee authorization;

OR

The legal representative of a deceased or legally incapacitated employee.

Emergency any event that could or does result in the unexpected significant release of benzene. Examples of emergencies include equipment failure, container rupture, or control equipment failure.

Exposure the contact an employee has with benzene, whether or not protection is provided by respirators or other personal protective equipment (PPE). Contact can occur through various routes of entry such as inhalation, skin contact, or skin absorption.

Licensed health care professional (LHCP) an individual whose legally permitted scope of practice allows him or her to provide some or all of the health care services required for medical evaluations.

Permissible exposure limits (PELs) PELs are exposure concentrations to toxic substances or harmful agents that must not be exceeded. PELs are specified in various WISHA rules found in other chapters. The PELs for benzene are the:

- Eight-hour time-weighted average (TWA_8) of 1 part per million (ppm);

AND

- Fifteen-minute short-term exposure limit (STEL) of 5 ppm.

Short-term exposure limit (STEL) an exposure limit averaged over a fifteen-minute period that must not be exceeded during any part of an employee's workday.

Time-weighted average (TWA_8) an exposure limit averaged over an eight-hour period that must not be exceeded during an employee's workday.

Vapor control systems equipment that controls the vapor displaced when chemicals are loaded and unloaded from truck or storage tanks. It also processes or balances the vapor back into the truck or storage tanks.